CLAIMS

What is claimed is:

1. A method comprising:

programming an associative memory with a plurality of sets of entries, each of the

5   plurality of sets of entries associated with a different one of a plurality of unique decoder

fields, and each entry within a particular one of the plurality of sets of entries including a

same one of the plurality of unique decoder fields;

receiving a piece of information including a data item and a decoder value;

deriving a first lookup word including the data item and the decoder value; and

10   performing a lookup operation on the associative memory using the first lookup

word to generate a first lookup result.

2. The method of claim 1, wherein a first set of the plurality of sets of entries

includes a different number of entries than a second set of the plurality of sets of entries.

3. The method of claim 1, wherein the decoder value includes a set value and a

15   subset value.

4. The method of claim 1, further comprising:

receiving a second piece of information including a data item and a nested

condition indication;

identifying the nested condition;

20   generating a plurality of lookup words in response to said identifying, each of the

plurality of lookup words including the data item and one of a plurality of predetermined

decoder values.

5. A method comprising:

programming an associative memory with a plurality of sets of entries, each of the plurality of sets of entries including a different one of a plurality of unique decoder fields;

receiving a piece of information including a data item;

5   identifying a nested condition associated with the data item;

in response to said identifying the nested condition, generating a plurality of lookup words with a predefined set of decoder fields of the plurality of unique decoder fields.

6. The method of claim 5, wherein the piece of information includes a nested

10   condition indication.

7. The method of claim 5, wherein the piece of information does not include a nested condition indication.

8. The method of claim 5, wherein at least two of the plurality of sets of entries have a different number of entries.

15   9. The method of claim 5, wherein each of the plurality of entries has at least two entries.

10. The method of claim 5, further comprising forwarding a lookup indication to a receiver.

11. The method of claim 10, wherein the lookup indicator indicates the presence

20   or absence of the nested condition.

12. The method of claim 10, wherein the lookup indicator indicates a result context.

13. The method of claim 5, further comprising forwarding the plurality of lookup words to an associative memory.

14. The method of claim 13, wherein the associative memory includes a ternary or binary content-addressable memory.

5   15. A computer-readable memory containing computer-executable instructions for performing the method of claim 5.

16. The method of claim 5, further comprising performing a lookup operation on each of the plurality of lookup words to generate a plurality of lookup results.

17. The method of claim 16, further comprising comparing a first lookup result of

10   the plurality of lookup results with a second lookup result of the plurality of lookup results to identify whether to perform processing based on the first or second lookup result.

18. A method for programming an associative memory, the method comprising:
performing for each particular one of a plurality of associative memory spaces:
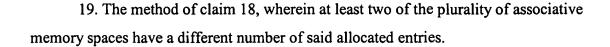
15   determining a size for said particular one of the plurality of associative memory spaces;

allocating at least the size number of entries for said particular one of the plurality of associative memory spaces;

assigning a unique decoder field to said particular one of the

20   plurality of associative memory spaces; and

adding said at least said size number of entries in the associative memory, wherein each of said at least said size number of entries includes the unique decoder field.

19. The method of claim 18, wherein at least two of the plurality of associative memory spaces have a different number of said allocated entries.

20. An apparatus comprising:

a lookup word generator for receiving a data item and for generating a plurality of

5   lookup words, each of the plurality of lookup words including the data item and a different one of a plurality of unique decoder fields;

an associated memory, coupled to the lookup word generator, for performing a lookup operation of each of the plurality of lookup word and to produce a plurality of associative memory results.

10   21. The apparatus of claim 20, further comprising: a memory, coupled to the associative memory, to receive the plurality of associative memory results and to generate a plurality of memory lookup results.

22. The apparatus of claim 21, further comprising a receiver to receive the plurality of memory lookup results; and

15   wherein the lookup word generator further communicates a lookup indication to the receiver.

23. The apparatus of claim 20, further comprising a receiver to receive the plurality of associative memory results.

24. The apparatus of claim 23, wherein the lookup word generator further

20   communicates a lookup indication to the receiver.

25. The apparatus of claim 23, wherein the receiver compares a first associative memory result of the plurality of associative memory results with a second associative memory result of the plurality of associative memory results.

26. The apparatus of claim 25, wherein a result of said comparison of the first and second associative memory results determines the first associative memory result is to be processed.

27. An apparatus comprising:

5   means for programming an associative memory with a plurality of sets of entries, each of the plurality of set of entries including a different one of a plurality of unique decoder fields;

means for receiving a piece of information including a data item;

means for identifying a nested condition associated with the data item;

10   means for generating in a plurality of lookup words with a predefined set of decoder fields of the plurality of unique decoder fields.

28. The apparatus of claim 27, wherein the piece of information includes a nested condition indication.

29. The apparatus of claim 27, further comprising means for forwarding a lookup

15 indication to a receiver.

30. The apparatus of claim 29, wherein the lookup indicator indicates the presence or absence of the nested condition.

31. The apparatus of claim 27, further comprising associative memory means for receiving the plurality of lookup words and for generating a plurality of lookup results.